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10/710,868

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Srikanth Sampath

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04/06/2007

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EXAMINER

MORRISON, JAY A

ART UNIT

PAPER NUMBER

2168

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/06/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/710,868	Applicant(s) SAMPATH ET AL.	
	Examiner Jay A. Morrison	Art Unit 2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remarks

1. Claims 1-40 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lomet (Patent Number 6,490,594) in view of Lahey et al. ('Lahey' hereinafter) (Patent Number 7,028,303) and further in view of Klotz et al. ('Klotz' hereinafter) (Publication

Number 2004/0015762) and further in view of Schmidt et al. ('Schmidt' hereinafter) ('Alleviating Priority Inversion and Non-determinism in Real-time CORBA ORB Core Architectures", 4th IEEE Real-time Technology and Applications Symposium, Denver, CO, June 3-5, 1998).

As per claim 1, Lomet teaches

In a database system, a ... method for performing recovery operations by ... , the method comprising: (see abstract and background)

to perform recovery operations (recovery; column 10, lines 51-60)

Lomet does not explicitly indicate "(a) spawning an initial recovery thread ... the initial recovery thread ... (c) spawning a subsequent recovery thread ... with the subsequent recovery thread ... as long as I/O performance does not degrade beyond a preselected percentage, to repeat steps (c) and (d) for spawning a desired number of additional recovery threads".

However, Lahey discloses "(a) spawning an initial recovery thread ... the initial recovery thread ... (c) spawning a subsequent recovery thread ... with the subsequent recovery thread ... as long as I/O performance does not degrade beyond a preselected percentage, to repeat steps (c) and (d) for spawning a desired number of additional recovery threads" (spawn threads, column 6, lines 18-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet and Lahey because using the steps of "(a) spawning an initial recovery thread ... the initial recovery thread ... (c) spawning a

subsequent recovery thread ... with the subsequent recovery thread ... as long as I/O performance does not degrade beyond a preselected percentage, to repeat steps (c) and (d) for spawning a desired number of additional recovery threads" would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

Lomet does not explicitly indicate "(b) measuring I/O (input/output) performance .. (d) measuring I/O performance".

However, Klotz discloses "(b) measuring I/O (input/output) performance .. (d) measuring I/O performance" (performance statistics, paragraph [0047]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "(b) measuring I/O (input/output) performance .. (d) measuring I/O performance" would have given those skilled in the art the tools to improve the invention by determine when heavy data loads are placing I/O stress on the system. This gives the user the advantage of being able to take measures to avoid stresses on the system.

Neither Lomet, Lahey, nor Klotz disclose "self-tuning ... dynamically adapting how many recovery threads are spawned during recovery", "self-tuning how many threads are spawned by continuing".

However, Schmidt discloses "self-tuning ... dynamically adapting how many recovery threads are spawned during recovery", "self-tuning how many threads are

spawned by continuing" (dynamically spawn threads, Section 2.1.2, "MiniCOOL" bullet-point).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, Klotz, and Schmidt because using the steps of "self-tuning ... dynamically adapting how many recovery threads are spawned during recovery", "self-tuning how many threads are spawned by continuing" would have given those skilled in the art the tools to improve the invention by being able to support applications with stringent real-time requirements. This gives the user the advantage of being able to have better response time.

As per claim 2,

Lomet does not explicitly indicate "I/O performance is measured over a given period of time."

However, Klotz discloses "I/O performance is measured over a given period of time" (paragraph [0047]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "I/O performance is measured over a given period of time" would have given those skilled in the art the tools to improve the invention by determine when heavy data loads are placing I/O stress on the system. This gives the user the advantage of being able to take measures to avoid stresses on the system.

As per claim 3,

Lomet does not explicitly indicate "the given period of time is about 1 second."

However, Klotz discloses "the given period of time is about 1 second" (paragraph [0047]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "the given period of time is about 1 second" would have given those skilled in the art the tools to improve the invention by determine when heavy data loads are placing I/O stress on the system. This gives the user the advantage of being able to take measures to avoid stresses on the system.

As per claim 4,

Lomet does not explicitly indicate "steps (c) and (d) are repeated for spawning additional recovery threads as long as I/O performance degrades by no more than about 15 percent".

However, Lahey discloses "steps (c) and (d) are repeated for spawning additional recovery threads as long as I/O performance degrades by no more than about 15 percent" (column 6, lines 18-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "steps (c) and (d) are repeated for spawning additional recovery threads as long as I/O performance degrades by no more than about 15 percent" would have given those

skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

As per claim 5,

Lomet does not explicitly indicate "steps (c) and (d) are repeated such that only a preconfigured maximum number of recovery threads may be generated."

However, Lahey discloses "steps (c) and (d) are repeated such that only a preconfigured maximum number of recovery threads may be generated" (column 6, lines 18-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "steps (c) and (d) are repeated such that only a preconfigured maximum number of recovery threads may be generated" would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

As per claim 6, Lomet teaches

a count of databases that can be opened (column 10, lines 25-38).

Lomet does not explicitly indicate "the maximum number of recovery threads is limited to not exceed".

However, Lahey discloses "the maximum number of recovery threads is limited to not exceed" (column 6, lines 18-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "the maximum number of recovery threads is limited to not exceed" would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

As per claim 7, Lomet teaches one less than a count of database engines online (column 10, lines 25-38). Lomet does not explicitly indicate "the maximum number of recovery threads is limited to not exceed".

However, Lahey discloses "the maximum number of recovery threads is limited to not exceed" (column 6, lines 18-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "the maximum number of recovery threads is limited to not exceed" would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

As per claim 8,

Lomet does not explicitly indicate "step (e) further comprises: when I/O performance measured for a just-spawned recovery thread degrades beyond the preselected percentage, putting the just-spawned recovery thread to sleep".

However, Lahey discloses "step (e) further comprises: when I/O performance measured for a just-spawned recovery thread degrades beyond the preselected percentage, putting the just-spawned recovery thread to sleep" (column 6, lines 1-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "step (e) further comprises: when I/O performance measured for a just-spawned recovery thread degrades beyond the preselected percentage, putting the just-spawned recovery thread to sleep" would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

As per claim 9,

Lomet does not explicitly indicate "after another recovery thread finishes, awaking the thread that has been put to sleep".

However, Lahey discloses "after another recovery thread finishes, awaking the thread that has been put to sleep" (column 6, lines 8-18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of

“after another recovery thread finishes, awaking the thread that has been put to sleep” would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

As per claim 10, Lomet teaches steps (c) and (d) are repeated up to a configured maximum number of databases that can be recovered concurrently (column 10, lines 25-38).

As per claim 11, Lomet teaches recovers a single database at a time (column 16, lines 23-41).
Lomet does not explicitly indicate “each recovery thread itself”.
However, Lahey discloses “each recovery thread itself” (column 6, lines 35-45).
It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of “each recovery thread itself” would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

As per claim 12,
Lomet does not explicitly indicate “a user of the system is able to specify a particular number of concurrent recovery threads”.

However, Lahey discloses “a user of the system is able to specify a particular number of concurrent recovery threads” (column 5, lines 4-20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of “a user of the system is able to specify a particular number of concurrent recovery threads” would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

and wherein the system generates an advisory if the particular number of concurrent recovery threads specified can be changed to achieve better I/O performance. (‘if’ denotes an optionally recited limitation and optionally recited limitations are not guaranteed to take place and are therefore not required to be taught, see MPEP § 2106 Section II(C))

As per claim 13, Lomet teaches

A computer-readable medium having processor-executable instructions for performing the method of claim 1. (column 9, lines 32-43).

As per claim 14, Lomet teaches

downloading a set of processor-executable instructions for performing the method of claim 1. (column 9, lines 32-43)

As per claim 15, Lomet teaches

A database system performing recovery operations by ... , the system comprising: (see abstract and background)

a database system having at least one database that may require recovery;
(database, column 12, lines 18-38)

Lomet does not explicitly indicate "an initial recovery thread that is spawned to perform recovery operations ... and a plurality of additional recovery threads that are spawned to perform recovery operations ... with the initial recovery thread ... with each additional recovery thread that is spawned, and wherein the system ceases spawning additional recovery threads."

However, Lahey discloses "an initial recovery thread that is spawned to perform recovery operations ... and a plurality of additional recovery threads that are spawned to perform recovery operations ... with the initial recovery thread ... with each additional recovery thread that is spawned, and wherein the system ceases spawning additional recovery threads" (spawn threads, column 6, lines 18-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet and Lahey because using the steps of "an initial recovery thread that is spawned to perform recovery operations ... and a plurality of additional recovery threads that are spawned to perform recovery operations ... with the initial recovery thread ... with each additional recovery thread that is spawned, and wherein the system ceases spawning additional recovery threads" would have given those skilled in the art the tools to improve the invention by managing the workflow in a

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computing system. This gives the user the advantage of having more efficient use of limited resources.

Lomet does not explicitly indicate "wherein the system measures I/O (input/output) performance ... wherein the system ... based on I/O (input/output) performance ... when I/O performance degrades beyond a desired amount."

However, Klotz discloses "wherein the system measures I/O (input/output) performance ... wherein the system ... based on I/O (input/output) performance ... when I/O performance degrades beyond a desired amount" (performance statistics, paragraph [0047]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "wherein the system measures I/O (input/output) performance ... wherein the system ... based on I/O (input/output) performance ... when I/O performance degrades beyond a desired amount" would have given those skilled in the art the tools to improve the invention by determine when heavy data loads are placing I/O stress on the system. This gives the user the advantage of being able to take measures to avoid stresses on the system.

Neither Lomet, Lahey, nor Klotz disclose "dynamically adapting how many recovery threads are spawned during recovery", "dynamically adjusts how many recovery threads are spawned".

However, Schmidt discloses “dynamically adapting how many recovery threads are spawned during recovery”, “dynamically adjusts how many recovery threads are spawned” (dynamically spawn threads, Section 2.1.2, “MiniCOOL” bullet-point).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, Klotz, and Schmidt because using the steps of “dynamically adapting how many recovery threads are spawned during recovery”, “dynamically adjusts how many recovery threads are spawned” would have given those skilled in the art the tools to improve the invention by being able to support applications with stringent real-time requirements. This gives the user the advantage of being able to have better response time.

As per claims 16-26,

These claims are rejected on grounds corresponding to the arguments given above for rejected claims 2-12 and are similarly rejected.

As per claim 27, Lomet teaches

In a database system, an ... for performing database recovery in a manner that ... based on current performance, the method comprising: (see abstract and background)

Lomet does not explicitly indicate “spawning a thread to perform database recovery ... associated with that thread; and during recovery, ... by performing substeps of: attempting to spawn additional threads to perform database recovery and ...

associated with each additional thread spawned and if the performance for a given thread degrades beyond a desired amount, freezing execution of the given thread and ceasing any attempt to spawn additional threads for database recovery.”

However, Lahey discloses “spawning a thread to perform database recovery ... associated with that thread; and during recovery, ... by performing substeps of: attempting to spawn additional threads to perform database recovery and ... associated with each additional thread spawned and if the performance for a given thread degrades beyond a desired amount, freezing execution of the given thread and ceasing any attempt to spawn additional threads for database recovery” (spawn threads, column 6, lines 18-34; note: “if” denotes an optionally recited limitation and optionally recited limitations are not guaranteed to take place and are therefore not required to be taught, see MPEP § 2106 Section II(C)).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet and Lahey because using the steps of “spawning a thread to perform database recovery ... associated with that thread; and during recovery, ... by performing substeps of: attempting to spawn additional threads to perform database recovery and ... associated with each additional thread spawned and if the performance for a given thread degrades beyond a desired amount, freezing execution of the given thread and ceasing any attempt to spawn additional threads for database recovery” would have given those skilled in the art the tools to improve the invention by managing the workflow in a computing system. This gives the user the advantage of having more efficient use of limited resources.

Lomet does not explicitly indicate "and recording statistics about performance".

However, Klotz discloses "and recording statistics about performance"
(performance statistics, paragraph [0047]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, and Klotz because using the steps of "and recording statistics about performance" would have given those skilled in the art the tools to improve the invention by determine when heavy data loads are placing I/O stress on the system. This gives the user the advantage of being able to take measures to avoid stresses on the system.

Neither Lomet, Lahey, nor Klotz disclose "auto-tuning method ... dynamically adjusts how many recovery threads are spawned", "dynamically adjusting how many threads are spawned".

However, Schmidt discloses "auto-tuning method ... dynamically adjusts how many recovery threads are spawned", "dynamically adjusting how many threads are spawned" (dynamically spawn threads, Section 2.1.2, "MiniCOOL" bullet-point).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lomet, Lahey, Klotz, and Schmidt because using the steps of "auto-tuning method ... dynamically adjusts how many recovery threads are spawned", "dynamically dynamically adjusting how many threads are spawned" would have given those skilled in the art the tools to improve the invention by being able to support applications with stringent real-time requirements. This gives the user the advantage of being able to have better response time.

As per claims 28-38

These claims are rejected on grounds corresponding to the arguments given above for rejected claims 2-12 are similarly rejected.

As per claim 39, Lomet teaches

A computer-readable medium having processor-executable instructions for performing the method of claim 27. (column 9, lines 32-43)

As per claim 40, Lomet teaches

downloading a set of processor-executable instructions for performing the method of claim 27. (column 9, lines 32-43)

Response to Arguments

4. Applicant's arguments with respect to claims 1-40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record, listed on form PTO-892, and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jay A. Morrison whose telephone number is (571) 272-7112. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached on (571) 272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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